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REVIEW OF THE BRISTOL BAY SALMON FISHERY

-1994-

ANNUAL SALMON MANAGEMENT REPORT TO THE ALASKA BOARD OF FISHERIES

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INTRODUCTION

The Bristol Bay area includes all coastal waters and inland waters east of a line from Cape Newenham to Cape Menshikof (Figure 1) and is the largest sockeye-producing region in the world. It also produces substantial returns of other salmon species as well as herring. The Togiak herring fishery is the State's largest sac roe fishery.

Bristol Bay is divided into five fishing districts: Togiak, Nushagak, Naknek/Kvichak, Egegik and Ugashik Districts. Associated with these districts are nine major rivers: Togiak, Igushik, Wood, Nushagak, Kvichak, Branch, Naknek, Egegik, and Ugashik Rivers (Figure 1). Several districts are divided into sections. Sections provide more management flexibility in controlling exploitation of individual stocks when more than one river system contributes to the district's return. The districts and sections are confined to areas near the river mouths in order to minimize interceptions of salmon destined for other areas. Fishing schedules are not the same for all districts and fishing times are established by regulation and emergency order (E.O.).

In the last 20 years (1974-1993), Bristol Bay commercial salmon harvests have averaged 20.2 million sockeye salmon, 109,000 chinook salmon, 1.2 million chum salmon, 1.7 million pink salmon (during even-numbered years), and 197,000 coho salmon. Since the last Board of Fisheries Bristol Bay meeting in January of 1992, the annual sockeye salmon inshore returns and harvests have been well above average (Tables 1, 2, and 3). The largest sockeye harvest on record of 40.5 million occurred in 1993.

Subsistence catches for the past 20 years have averaged approximately 173,000 salmon per year. In 1994, preliminary data indicates that approximately 149,000 salmon have been harvested by subsistence fishers. About 80% of the subsistence catch are sockeye salmon. Sport fisheries target on chinook and coho salmon, but pink, sockeye, and chum salmon are also taken.

The management objective for all districts in Bristol Bay is to achieve escapement goals for major salmon species while providing opportunities to harvest surplus fish.

1994 COMMERCIAL SALMON FISHERY

In 1994, the Bristol Bay commercial salmon fishery produced a cumulative harvest of 36.5 million fish (Table 4), worth approximately $140,400,000 to the 1,020 set gillnet and 1,887 drift gillnet permit holders. This was the seventh highest exvessel value in the history of the fishery, and the twelfth year in a row that the value of the Bristol Bay commercial salmon fishery has exceeded $100,000,000.

The 1994 sockeye salmon harvest of 35.3 million was the third highest on record and accounted for 97% of the total salmon harvest in Bristol Bay. The Naknek/Kvichak District was the top producer with a harvest of approximately 16.3 million sockeye salmon (Table 4). Sockeye salmon escapement goals were met or exceeded in all river systems except in the Naknek and Nushagak, where the final escapements were 1% and 8% below their point goals, respectively (Table 5).

The chinook salmon return was above average in 1994. The commercial harvest of 140,000 fish was the sixth highest in the past 20 years (Table 6), and 29% above the recent 20-year average of 109,000. All

districts except Egegik and Togiak experienced average to above average harvests. The Nushagak District had the largest harvest with approximately 119,000 chinook salmon taken. Chinook salmon escapements were above average in most of the systems surveyed.

The 1994 chum salmon harvest of 832,000 was 29% below the 20-year average of 1.2 million and 34% below the recent 10-year average of 1.3 million (Table 6). Chum salmon harvests have been declining for the last three years. Escapements for all districts, except Egegik, were average to above average.

Bristol Bay pink salmon returns are largest in even-numbered years, but the 1994 harvest of 91,000 was well below the even-numbered 20-year average of 1.7 million (Table 6). Pink salmon escapements into two of the major producing systems, the Nushagak and Togiak Rivers, were well below average.

The Bay's coho salmon harvest was slightly (9%) below average in 1994. The catch of 179,000 fish was the tenth largest since 1974 (Table 6). The Nushagak District harvest was well below average while other catches ranged from average in the Naknek/Kvichak and Ugashik Districts to above average in the Egegik and Togiak Districts. The Togiak District had the largest catch with approximately 97,000 coho salmon taken.

SOCKEYE SALMON

The 1994 sockeye salmon return to Bristol Bay of 50.6 million was 3% below the preseason forecast of 52.4 million (Table 7). Returns to all major river systems except Egegik and Naknek were close to forecast. The inshore harvest of 35.3 million sockeye salmon was 74% above the recent 20-year (1974-1993) average of 20.2 million. Minimum escapement goals were met or exceeded in all systems (Table 5).

Naknek/Kvichak District

The Naknek/Kvichak District total inshore return of 25.8 million sockeye salmon was 17% greater than the preseason forecast of 22.2 million. This was due primarily to a larger than expected return of age-2.2 fish to the Kvichak and Naknek Rivers. These 5-year old fish came from the 1989 parent-year escapements of 8.3 million into the Kvichak River and 1.2 million into the Naknek River.

Preseason management strategy called for early fishing periods during the emergency order period in the entire district. A restricted fishing schedule, 4-days per week, was used for three weeks before and one week after the emergency order period to promote the escapement of other species. Early fishing periods are used to assess early run strengths and effort levels. Harvest and effort levels in early June are usually low. The harvest during the pre-emergency order period was about 37,000 sockeye salmon.

In the Naknek/Kvichak District it is often difficult to harvest surplus Naknek sockeye salmon while not adversely affecting the Kvichak sockeye return. The 1994 season was quite the opposite. The strength of the Kvichak sockeye return and the relative weakness of the Naknek return resulted in several openings for the Kvichak Section only. 'Kvichak Section only' openings had not occurred in the district since 1979.

The district's catch of 16.3 million sockeye was 84% Kvichak River fish. The harvest of 13.8 million Kvichak River sockeye salmon was well above the predicted Kvichak harvest of 9.8 million. The Kvichak River escapement of 8.3 million was slightly over the escapement point goal of 8.0 million. The

Naknek River harvest of 2.0 million sockeye salmon was 33% below the preseason forecast of 2.9 million. The abundance of age-2.2 fish was not enough to offset the lack of other age groups. The Naknek River escapement of 991,000 sockeye salmon was slightly under the point goal of 1.0 million.

Peak harvest occurred in the district from July 6 to July 10 with catches exceeding 1.0 million sockeye salmon per day. Large daily catches continued through July 18, after which the sockeye harvest dropped off fairly sharply. Peak effort occurred between July 12 and July 17 with over 800 drift boats registered for four of those six days. Set net deliveries were also high during this period with a daily average of 270.

Egegik District

The 1994 Egegik District inshore sockeye salmon return of approximately 12.8 million was the third largest return on record. The commercial harvest of 10.8 million sockeye salmon was the third largest in the 100-year history of the Egegik fishery. The escapement of almost 2.0 million was the fourth largest on record.

Management of the district was influenced by the large preseason forecast, the need to conserve other salmon species, and the desire to provide for an orderly fishery while allowing opportunity to harvest surplus sockeye salmon. The relatively weak chinook salmon escapements into the Egegik system, since 1989, have prompted a change in management strategy. In order to increase chinook escapements, sockeye fishing time has been limited during mid-June (June 16-23). Mid-June is usually the peak time of chinook salmon harvest in the commercial fishery.

The 1994 season began June 1 with very little fishing effort and no landings reported until June 6. Prior to the emergency order period, the harvest totaled 1,700 sockeye and less than 100 chinook salmon. The emergency order period began June 16 and continued until 9:00 a.m. July 17. The fishery was kept closed from June 16 until a "shakedown" opening was authorized for June 23. Fishing effort levels were high during this short, 8-hour, opening with 691 drift gillnet and 163 set gillnet deliveries reported, but the sockeye catch was minimal with only 52,000 fish taken. Given the huge Egegik forecast, a liberal approach to fishing time in late June was the management strategy adopted and fishing periods occurred on June 25, 27, 29, and 30. In spite of the large fishing effort with over 800 drift and 160 set net deliveries for each period, the sockeye harvest remained relatively low and averaged 135,000 fish per period. Thus indicating that perhaps the sockeye return to the district was arriving a little later than normal.

The peak harvest occurred in the district from July 2 to July 9 with three out of seven openings each producing a catch of over 1 million sockeye salmon. From June 25 through July 4 there were over 800 vessels registered for the Egegik District. Drift gillnet effort dropped off as fishers began to move to the Naknek/Kvichak District, which was beginning to show good run strength. However, the remaining Egegik District effort was sufficient enough to produce sockeye catches thereafter of over 100,000 fish per day through July 21. By the end of the season, the 1994 Egegik District sockeye harvest rate was 85%, slightly above the recent 20-year (1974-1993) average of 82%.

Sockeye salmon escapement peaked at the Egegik River counting tower from July 4 through July 9 with daily counts averaging 182,000. In 1994, there were eight days with tower counts in excess of 100,000 sockeye salmon.. Though the final count of almost 2.0 million was twice the point escapement goal of 1.0 million, each segment of the return was well represented in the escapement.

Some fishing time was allowed each day from June 29 through the end of the emergency order period. Window closures of one or two complete tide cycles were alternated with openings to continue chum and chinook salmon escapement. The closures also allowed sockeye salmon a chance to distribute throughout the district. Beginning July 17 the district reverted to a 4-days-per-week fishing schedule. The district remained on this schedule until the commercial salmon season closed on September 30. Sockeye harvest continued in the district through mid-August.

The 1994 Egegik District sockeye salmon return consisted of primarily age-2.2, 5-year old fish (47%), and age-2.3, 6-year old fish (43%). The proportion of these age groups was about equal in the catch, but in the escapement the age-2.2 fish represented 63% of the total, while the age-2.3 fish represented 25%. The parent-year escapements for these age groups were 1.6 million in 1988 and 1.6 million in 1989. There was also a relatively large return (3% in the escapement) of age-2.1 jacks from the 1990 parent-year escapement of 2.2 million.

Ugashik District

The Ugashik District sockeye salmon return totaled approximately 5.5 million fish. The district's harvest of about 4.4 million fish was the third largest recorded in the 102-year history of the fishery. The sockeye escapement of about 1.1 million was the twelfth largest on record.

The Ugashik sockeye return ordinarily demonstrates the latest run-timing of east side Bristol Bay stocks. Catches before July 3 are typically low. This year's total catch during the pre-emergency order period was average with about 17,000 sockeye salmon taken.

Before and during the season fishers were advised the district would be managed similar to the 1993 season with the possible exception of a little more fishing time in late June and early July. The hint of earlier fishing did not attract any substantial amount of the fleet away from the more promising Egegik and Naknek/Kvichak Districts. The management policy for the past several seasons had been designed to concentrate fishing effort on Ugashik sockeye salmon rather than on other sockeye stocks passing through the district with earlier run timings. Therefore, very little fishing time was usually authorized in the district from June 23 through July 3. Fishing time after the onset of the emergency order period usually depended on the sockeye escapement rate into the lower portions of Ugashik River. Evidence of the escapement rate came from observations of fish movement and from inriver test fishing. However, in 1994, with little fishing effort in the district and a need for Age-Weight-Length data from sockeye salmon milling in the district, a 12-hour fishing period was announced for June 27-28. The sockeye harvest for this opening was minimal with only 17,000 fish taken.

Two more openings occurred before the Ugashik sockeye return showed much strength. Openings on June 30 and July 3 yielded sockeye catches of 78,000 and 64,000 fish, respectively. A July 6 fishing period yielded a catch of 342,000 sockeye indicating that the run was close to arriving in strength. Subsequent openings beginning on July 8 occurred every day throughout the remainder of the emergency order period, and averaged 295,000 sockeye per day. By July 17 the sockeye escapement goal was reached and continuous fishing was allowed from July 19 through July 28. Fishing effort dropped off fairly quickly after July 22, but a late pulse of fish on July 26-27 provided some very good catches for the remaining effort. Over 100,000 sockeye salmon were landed on each of those days.

Peak harvests in the fishery occurred July 9, 13, and 14, with over 468,000 sockeye salmon landed during each period. Sockeye catches exceeding 100,000 fish occurred on 15 days between July 6 and

July 27. By the end of the season, an 80% harvest rate had occurred on the district's sockeye, which was well above the recent 20-year (1974-1993) average of 62%.

Sockeye escapement counts at Ugashik River counting tower peaked July 11-12 with daily counts exceeding 200,000 fish each day. The total sockeye escapement to the Ugashik system was estimated at 1.1 million or 56% above the point escapement goal of 700,000.

The 1994 Ugashik District sockeye salmon return consisted of primarily of age-2.2, 5-year old fish (45%), and age-2.3, 6-year old fish (40%). The proportion of these age groups in the catch was about equal, but in the escapement the age-2.2 fish represented 66%, while the age-2.3 fish contributed 25%. The parent-year escapements for these age groups were 1.7 million in 1989 and 654,000 in 1988. Approximately 2% of the escapement were jacks or 1-ocean fish.

The fishery reverted to a 4-days-per-week fishing schedule beginning July 17, but the scheduled weekend closure for July 23-24 was canceled by emergency order due to the large sockeye escapement. The fishery continued uninterrupted until July 29. Four days per week fishing remained in effect until the end of the commercial fishing the season on September 30.

Nushagak District

The 1994 Nushagak District sockeye salmon inshore return of approximately 5.9 million fish was well below last year's return of 7.5 million, but 10% above the preseason forecast of 5.3 million (Tables 2 and 7). The district's sockeye harvest of 3.4 million was slightly above the recent 20-year (1974-1993) average of 3.1 million. The Nushagak River sockeye escapement of 508,000 fish was within the management range, but slightly under the point escapement goal of 550,000.

Inseason management of the Nushagak salmon resource is difficult, due to the mixing of several stocks in a common harvest area. Three major sockeye salmon stocks, the Wood, Nuyakuk and Nushagak stocks have similar run timings and all traverse a common fishing district. Historically, the Wood and Nuyakuk River stocks have accounted for most of the Nushagak District sockeye production, but recently the Nushagak and Mulchatna Rivers' stocks have out-produced the Nuyakuk. The department recognizes that the Nuyakuk sockeye salmon display a slightly earlier run timing than Wood River stocks, and therefore, early season closures would be beneficial to rebuilding Nuyakuk River sockeye returns. Additionally, early season closures have provided some protection for depressed chinook stocks.

Before the season, fishers were advised that the fishery would be managed in a fashion similar to past years. The department projected average run strengths for Nushagak and Wood River sockeye, and a relatively strong return to the Igushik River. The department intended to manage the fishery inseason along a 2:1 ratio of harvest to escapement. Given the expected strong Igushik return and the fact that escapements have exceeded the escapement goal for the past five years, fishery managers intended to increase the exploitation on Igushik River sockeye by scheduling more openings for the Igushik Section.

The directed sockeye fishery began July 1 with an Igushik Section opening, because the Igushik escapement was stronger than either Wood or Nushagak. The first district-wide opening occurred July 2. During the interval from July 3-7 Igushik Section only openings were scheduled for portions of each day. Additionally, separate short district-wide openings were also scheduled each day. By July 7, the cumulative sockeye catch was 1.3 million fish, and escapement rates in the Wood and Nushagak Rivers had tapered off dramatically. The district remained closed through

July 8, but re-opened on July 9, and remained open through midnight, July 20. The district then closed for the rest of the season to protect a weak coho return.

Before the July 9 opening, the harvest to escapement ratio was 2.2:1, or slightly higher than the pre-season forecast ratio. The largest movement of fish occurred on July 9 and 10. Total harvest exceeded one million sockeye salmon over those two days, and the Nushagak District sockeye escapement increased by 836,000 fish. Sockeye catches exceeding 200,000 fish occurred for eight days between July 3 and July 16.

The Wood River escapement point goal of 1.0 million was reached on July 11. By the time fishing closed on July 20, the escapement tallied 1.4 million fish. An additional 73,000 fish passed the counting tower by July 24, when the tower project was terminated. In spite of liberal commercial fishing in the Igushik Section, the sockeye escapement into the Igushik River was over twice the goal of 200,000. The final Nushagak River sockeye escapement of 508,000 was 8% below the goal of 550,000 (Table 5).

In 1994, effort levels were fairly constant in the district with over 280 drift gillnet vessels registered for most of the season. Peak effort, estimated from aerial surveys, was observed on July 5 with 287 drift vessels and 283 setnetters reported fishing. Effort levels were actually higher during the June chinook salmon fishery. By July 9, effort had declined to 247 boats and 172 set nets, and the decline continued through the season.

Approximately 59% of the inshore Nushagak District return was harvested, which was slightly above the recent 20-year (1974-1993) average of 56%. Inshore returns for all systems were close to the preseason forecast (Table 7).

Togiak District

The Togiak District inshore sockeye salmon return was 635,000 fish. The sockeye return to the Togiak Section was 495,000 fish or 4% below the pre-season forecast of 518,000 (Table 7). The Togiak Section harvest of 321,000 sockeye was 13% below the predicted section harvest. The 1994 inshore sockeye return to Togiak District was the lowest since 1990 and it provided the lowest harvest since 1990. The inshore return was 7% below the recent 20-year average.

Commercial fishing for sockeye salmon began July 1, following a closure in late June to protect chinook salmon. In all sections, fishing time was extended past the regular scheduled periods. Extending early fishing periods was an attempt to harvest more sockeye salmon from the early segments of the returns, and thus, reduce the risk of exceeding the sockeye escapement goal. The weekly commercial fishing schedule was extended five times adding an additional 122 hours to the fishery between July 1 and August 7. After August 7, management emphasis shifted to coho salmon. The sockeye escapement into Togiak Lake totaled approximately 155,000 fish, or 3% above the escapement goal of 150,000 (Table 5).

CHINOOK SALMON

The Bristol Bay total commercial catch of 140,000 chinook salmon was 28% above the 20-year (1974-1993) average of 109,000, and twice the recent 10-year (1984-1993) average of 70,000 (Table 6). Approximately 119,000 chinook salmon or 85% of the Bay's harvest were taken in the Nushagak

District. The Nushagak harvest was well above average. Catches in other districts ranged from average in Ugashik and Naknek/Kvichak Districts to below average in Egegik and Togiak Districts. The Nushagak chinook salmon escapement of 97,000 exceeded the point escapement goal of 75,000 by 29%. (Table 5).

The chinook salmon harvest from the Togiak District was approximately 10,600 fish. This was about half the district's recent 20-year average of 22,000. The low production was primarily due to the management actions taken to increase escapement. The Togiak River chinook escapement was approximately 15,100. The total Togiak District chinook return of approximately 30,000 was 21% below the recent 20-year average of 38,000.

The commercial chinook harvests in the Naknek/Kvichak, Egegik, and Ugashik districts were approximately 6,100, 1,200, and 3,800 fish, respectively. The Naknek/Kvichak and Ugashik harvests were about average, while the Egegik harvest was well below the recent 20-year average of 2,900. Total escapement counts are not obtained in these districts but aerial surveys provide an annual index of escapement abundance. The 1994 aerial counts revealed above average escapements for all three districts.

CHUM SALMON

The total Bristol Bay commercial catch of 833,000 chum salmon was 29% below the 20-year average of 1.2 million (Table 6). It was the third smallest chum catch since 1974 and the third consecutive year with a harvest below one million fish.

Commercial harvests in the Naknek/Kvichak, Nushagak, and Togiak districts each exceeded 200,000 chum salmon, with the Nushagak District recording the largest harvest of 293,000. Compared to the recent 20-year average chum salmon catches by district, the 1994 chum harvests in all districts, except Togiak, were substantially below average. Escapements were average to above average in the Ugashik, Togiak and Nushagak districts to below average in the Egegik District Escapement data was incomplete in the Naknek/Kvichak District, but the escapement count in the Branch River was above average. The Nushagak River escapement of 379,000 was 27% greater than the 1974-1993 average escapement of 299,000. The Togiak Section escapement was approximately 24,000 fish under its goal. Chum escapements to the Togiak, Naknek/Kvichak, Egegik and Ugashik Districts have been estimated with aerial surveys. The Nushagak escapement has been counted with sonar.

PINK SALMON

The pink salmon returns to Bristol Bay are usually largest during even-numbered years. However, the 1994 harvest of 91,000 was well below the recent 20-year (1974-1993) average of 1.7 million (Table 6). The Togiak District produced the largest pink salmon harvest with a catch of approximately 70,000 fish or 77% of the Bay's production. Bay-wide escapement indicators revealed below average levels.

COHO SALMON

In 1994, the total commercial catch of coho salmon was approximately 179,000 fish, or 9% below the 1974-1993 average of 197,000 (Table 6). Harvests' rates were strong enough to permit commercial fishing in all districts of the Bay except the Nushagak District. The Nushagak District was closed to commercial harvest of coho salmon in late summer when it became apparent that the run was poor and that the escapement goal might not be reached. Usually the Nushagak District produces over half of the Bay's commercial coho harvest, but in 1994 it contributed only 7,000 fish or 4% of the Bay's harvest. The Nushagak escapement of 82,000 was 18% below the 100,000 fish escapement goal (Table 5). The Togiak District produced the largest coho harvest in the Bay with a total of 97,000 fish, or double the 1974-1993 average of 48,000. Togiak coho escapement surveys were limited, but escapements appeared to be fair to good. The Egegik District catch of 48,000 was 55% above the 1974 -1993 average of 31,000. The Naknek/Kvichak and Ugashik District coho catches were each about 22% below their 1974-1993 averages.

1995 FORECAST

The 1995 forecast of 55.1 million fish for the inshore Bristol Bay sockeye salmon run is the second largest forecast ever produced by the department. Only the inshore forecast of 55.8 million in 1970 was larger. The 1995 projected inshore harvest estimate is 40.3 million sockeye salmon (Table 8). If it is attained, it will be the second largest harvest in the history of the fishery exceeded only by the 1993 harvest of 40.5 million fish. The forecast sockeye harvests for inshore Bristol Bay fishing districts are as follows: 19.6 million for Naknek-Kvichak, 12.1 million for Egegik, 4.7 million for Ugashik, 3.5 million for Nushagak, and 356,000 for Togiak. The 1995 inshore Bristol Bay run will be well above the 1974-1993 average of 33.3 million fish. Sockeye returns are expected to exceed spawning escapement goals for all systems.

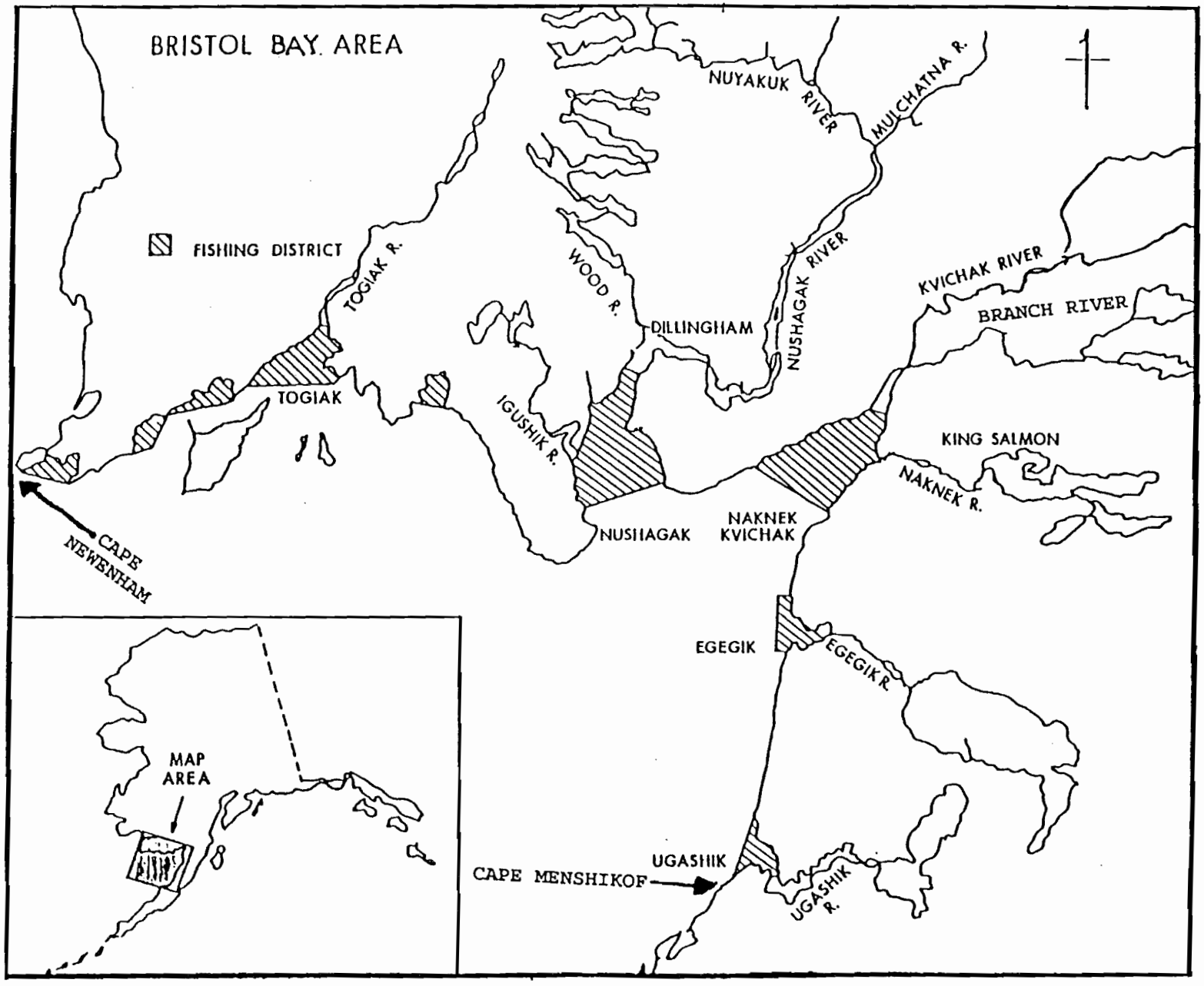

Figure 1. Bristol Bay area commercial salmon fishery management districts.

Table 1. Inshore commercial harvest and escapement of sockeye salmon, by river system, in thousands of fish, Bristol Bay, 1992.

District and River system		Commercial Harvest	Escapement	Total Inshore Return
NAKNEK-KVICHAK DISTRICT:				
	Kvichak River	5,722	4,726	10,448
	Branch River	282	225	507
	Naknek River	3,392	1,607	4,999
	Total	9,396	6,558	15,954
EGEGIK DISTRICT		15,647	1,946	17,593
UGASHIK DISTRICT		3,321	2,195	5,516
NUSHAGAK DISTRICT:				
	Wood River	1,192	1,286	2,478
	Igushik River	490	305	795
	Nushagak River	1,108	695	1,803
	Total	2,790	2,286	5,076
TOGIAK DISTRICT		726	267	993
TOTAL BRISTOL BAY		31,880	13,251	45,131

Table 2. Inshore commercial harvest and escapement of sockeye salmon, by river system, in thousands of fish, Bristol Bay, 1993.

District and River system		Commercial Harvest	Escapement	Total Inshore Return
NAKNEK-KVICHAK DISTRICT:				
	Kvichak River	5,264	4,025	9,289
	Branch River	467	348	815
	Naknek River	3,177	1,536	4,713
	Total	8,908	5,909	14,817
EGEGIK DISTRICT		21,601	1,517	23,118
UGASHIK DISTRICT		4,177	1,413	5,590
NUSHAGAK DISTRICT:				
	Wood River	2,544	1,176	3,720
	Igushik River	1,172	406	1,578
	Nushagak River	1,521	715	2,236
	Total	5,237	2,297	7,534
TOGIAK DISTRICT		540	242	782
TOTAL BRISTOL BAY		40,463	11,379	51,842

Table 3. Inshore commercial harvest and escapement of sockeye salmon, by river system, in thousands of fish, Bristol Bay, 1994. [a]

District and River system		Commercial Harvest	Escapement	Total Inshore Return
NAKNEK-KVICHAK DISTRICT:				
	Kvichak River	13,841	8,338	22,179
	Branch River	390	243	633
	Naknek River	2,032	991	3,023
	Total	16,263	9,572	25,835
EGEGIK DISTRICT		10,798	1,968	12,766
UGASHIK DISTRICT		4,369	1,095	5,464
NUSHAGAK DISTRICT:				
	Wood River	1,516	1,472	2,988
	Igushik River	865	446	1,311
	Nushagak River	1,052	508	1,560
	Snake River		21	21
	Total	3,433	2,446	5,880
TOGIAK DISTRICT		401	234	635
TOTAL BRISTOL BAY		35,264	15,315	50,579

[a] Preliminary data.

Table 4. Inshore commercial salmon harvest by district and species, in thousands of fish, Bristol Bay, 1994.[a]

District	Sockeye	Chinook	Chum	Pink	Coho	Total
Naknek-Kvichak	16,263	6	201	12	7	16,489
Egegik	10,798	1	57	0	48	10,904
Ugashik	4,369	4	49	0	20	4,442
Nushagak	3,433	119	293	9	7	3,861
Togiak	401	10	232	70	97	810
Total	35,264	140	832	91	179	36,506

[a] Preliminary data.

Table 5. Salmon escapements in thousands of fish, by river system and species, compared with escapement goals and ranges, Bristol Bay, 1994.

Species / River System		Actual [a]	Goal	Management Range	Percent Deviation [b]
Sockeye Salmon					
Kvichak		8,338	8,000	6,000 - 10,000	4%
Branch		243	185	170 - 200	31%
Naknek		991	1,000	800 - 1,400	-1%
Egegik		1,968	1,000	800 - 1,200	97%
Ugashik		1,095	700	500 - 900	56%
Wood		1,472	1,000	800 - 1,200	47%
Igushik		446	200	150 - 250	123%
Nushagak		508	550	340 - 750	-8%
Togiak		155	150	100 - 200	3%
Other [c]		100			
	Total	15,315	12,785	10,660 - 16,100	20%
Chinook Salmon					
Nushagak	**Total**	97	75	50 - 100	29%
Chum Salmon					
Togiak	**Total**	176	200		-12%
Coho Salmon					
Nushagak		82	100		-18%
Togiak [d]		14	50		
Kulukak [e]			15		
	Total	96	165		

[a] Actual escapement numbers are based on final tower counts, Nushagak sonar counts, and aerial surveys of Branch, King Salmon, Dog Salmon, Kulukak, and Snake Rivers, as well as Togiak Tributaries.

[b] Percent deviation = (actual minus goal)\ goal X 100. Negative numbers indicate the percent below the goal.

[c] Includes Snake, Kulukak, Slug, Osviak, Matogak, Quigmy, Negukthlik, and Ungalikthluk Rivers, plus Togiak mainstem and tributaries.

[d] Post-peak survey.

[e] No survey conducted due to high and turbid water conditions.

Table 6. Historical commercial salmon harvest by species, in thousands of fish, Bristol Bay, 1974-1994.

Year	Sockeye	Chinook	Chum	Pink	Coho	Total
1974	1,362	46	286	940	44	2,678
75	4,899	30	325	0	46	5,300
76	5,619	96	1,329	1,037	27	8,108
77	4,878	131	1,598	5	107	6,719
78	9,928	192	1,158	5,153	94	16,525
1979	21,429	213	907	4	294	22,847
80	23,762	96	1,301	2,563	348	28,070
81	25,603	237	1,505	7	314	27,666
82	15,104	254	921	1,492	620	18,391
83	37,372	199	1,632	0	128	39,331
1984	24,710	102	2,023	3,366	575	30,776
85	23,703	120	1,068	0	163	25,054
86	15,776	94	1,227	401	182	17,680
87	16,069	75	1,529	0	65	17,738
88	13,990	45	1,469	955	202	16,661
1989	28,735	40	1,259	0	240	30,274
90	33,523	34	1,058	497	103	35,215
91	25,821	30	1,290	0	118	27,259
92	31,879	69	921	500	192	33,561
93	40,462	86	838	0	73	41,459
1974-93 Ave.	20,231	109	1,182	1,690 [b]	197	22,566
1974-83 Ave.	14,996	149	1,096	2,237 [b]	202	17,564
1984-93 Ave.	25,467	70	1,268	1,144 [b]	191	27,568
1994 [a]	35,264	140	832	91	179	36,506

[a] Preliminary totals.

[b] Only even-numbered years used in calculation.

Table 7. Sockeye salmon preseason forecast compared to total inshore run, by river system, in thousands of fish, Bristol Bay, 1994. [a]

District and River system		Preseason Forecast	Actual Inshore Run	Percent Forecast Error [b]
NAKNEK-KVICHAK DISTRICT:				
	Kvichak River	17,783	22,178	25%
	Branch River	490	633	29%
	Naknek River	3,878	3,023	-22%
	Total	22,151	25,834	17%
EGEGIK DISTRICT		18,852	12,766	-32%
UGASHIK DISTRICT		5,575	5,464	-2%
NUSHAGAK DISTRICT:				
	Wood River	2,350	2,988	27%
	Igushik River	1,474	1,311	-11%
	Nushagak River	1,485	1,560	-5%
	Snake River		21	
	Total	5,309	5,880	11%
TOGIAK DISTRICT		518	635	23%
TOTAL BRISTOL BAY		52,405	50,579	-3%

[a] The inshore run data does not include the 1994 False Pass/Alaska Peninsula forecast nor actual harvest of Bristol Bay sockeye salmon.

[b] Percent Error = (Actual Inshore Run minus Preseason Forecast) \ Preseason Forecast X 100.

Table 8. Sockeye salmon forecast, escapement goals, and projected commercial harvest by river system, Bristol Bay, 1995.

District River		Forecast Total Production	Shumagin Islands - S.Unimak Harvest	Number of Sockeye salmon (thousands) Bristol Bay Inshore Run Total Run	Spawning Goal	Estimated Harvest
NAKNEK-KVICHAK						
	Kvichak	26,719	1,659	25,060	10,000 [a]	15,060
	Branch	516	32	484	185	299
	Naknek	5,633	350	5,283	1,000	4,283
	Total	32,868	2,041	30,827	11,185	19,642
EGEGIK		13,926	865	13,061	1,000	12,061
UGASHIK		5,763	358	5,405	700	4,705
NUSHAGAK						
	Wood	3,121	194	2,927	1,000	1,927
	Igushik	1,199	74	1,125	200	925
	Nushagak/ Mulchatna	1,300	81	1,219	550	669
	Total	5,620	349	5,271	1,750	3,521
TOGIAK		539	33	506	150	356
TOTAL BRISTOL BAY		58,716	3,646	55,070	14,785	40,285

[a] The 1995 spawning goal for the Kvichak River will be finalized during the January 1995 Board of Fisheries meeting. The Alaska Department of Fish and Game is recommending a 10 million escapement.

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